

## 16A SCRs

### Features

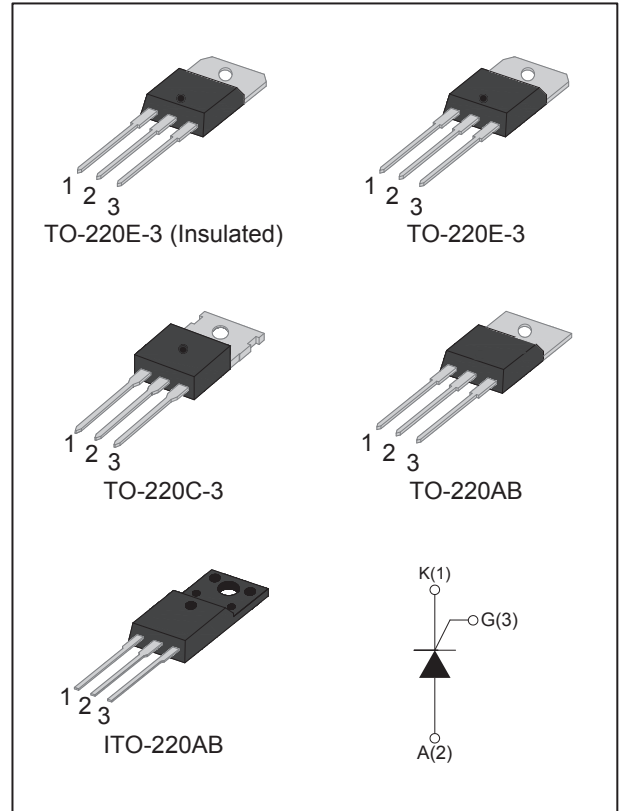
- Glass passivated chip junction
- High thermal cycling performance
- High voltage capacity
- Very high current surge capability
- Pb-free
- RoHS compliant

### Applications

- Line rectifying 50/60 Hz
- Softstart AC motor control
- DC Motor control
- Power converter
- AC power control
- Lighting and temperature control

### Main Features

Symbol	Value	Unit
$I_{T(RMS)}$	16	A
$V_{DRM} / V_{RRM}$	600 / 1000	V



### Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Storage junction temperature range	$T_{STG}$	-40 to 150	°C
Operating junction temperature range	$T_J$	-40 to 125	°C
Repetitive peak off-state voltage ( $T_J = 25^\circ\text{C}$ )	$V_{DRM}$	600 / 1000	V
Repetitive peak reverse voltage ( $T_J = 25^\circ\text{C}$ )	$V_{RRM}$	600 / 1000	V
RMS on-state current	TO-220E-3(Ins) ( $T_C=90^\circ\text{C}$ )	16	A
	TO-220E-3 ( $T_C=110^\circ\text{C}$ )		
	TO-220C-3 ( $T_C=110^\circ\text{C}$ )		
	TO-220AB ( $T_C=110^\circ\text{C}$ )		
	ITO-220AB ( $T_C=90^\circ\text{C}$ )		
Non repetitive surge peak on-state current (180° conduction angle, $F = 50\text{Hz}$ , $t_P = 10\text{ms}$ , half full cycle)	$I_{TSM}$	190	A
$I^2t$ value for fusing ( $t_P = 10\text{ms}$ )	$I^2t$	180	$\text{A}^2\text{s}$
Critical rate of rise of on-state current ( $I_G = 2 \times I_{GT}$ , $t_r \leq 100\text{ns}$ )	$di/dt$	50	$\text{A}/\mu\text{s}$
Peak gate current	$I_{GM}$	4	A
Average gate power dissipation	$P_{G(AV)}$	1	W

## Electrical Characteristics ( $T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Test Condition		Value	Unit
$I_{GT}$	$V_D = 12\text{V}, R_L = 100\Omega$	MAX	15	mA
$V_{GT}$	$V_D = 12\text{V}, R_L = 100\Omega$	MAX	1.3	V
$V_{GD}$	$V_D = V_{DRM}, T_J = 125^\circ\text{C}$	MIN	0.2	V
$I_L$	$I_G = 1.2 \times I_{GT}$	MAX	60	mA
$I_H$	$V_{AK} = 12\text{V}, I_{GK} = 100\text{mA}$	MAX	50	mA
dV/dt	$V_D = 67\% V_{DRM}, \text{Gate open}, T_J = 125^\circ\text{C}$	MIN	500	V/ $\mu\text{s}$

## Static Characteristics

Symbol	Test Condition		Value	Unit
$V_{TM}$	$I_{TM} = 32\text{A}, t_p = 380\mu\text{s}$	$T_J = 25^\circ\text{C}$ MAX	1.6	V
$I_{DRM}$ $I_{RRM}$	$V_D = V_{DRM}, V_R = V_{RRM}$	$T_J = 25^\circ\text{C}$ MAX	5	$\mu\text{A}$
		$T_J = 125^\circ\text{C}$ MAX	2	mA

## Thermal Resistances

Symbol	Parameter	Value	Unit	
$R_{\theta JC}$	Junction to case(AC)	TO-220E-3(Ins)	2.1	$^\circ\text{C/W}$
		TO-220E-3	1.1	
		TO-220C-3	1.1	
		TO-220AB	1.1	
		ITO-220AB	2.3	

## Ordering Information

Ordering Type	Marking	Package	Quantity	Delivery Mode
CR16xx-600EI	CR16xx-600EI	TO-220E-3(Ins)	50	Tube
CR16xx-600E	CR16xx-600E	TO-220E-3	50	Tube
CR16xx-600C	CR16xx-600C	TO-220C-3	50	Tube
CR16xx-600T	CR16xx-600T	TO-220AB	50	Tube
CR16xx-600TF	CR16xx-600TF	ITO-220AB	50	Tube
SCR16xx-yyEI	SCR16xx-yyEI	TO-220E-3(Ins)	50	Tube
SCR16xx-yyE	SCR16xx-yyE	TO-220E-3	50	Tube
SCR16xx-yyC	SCR16xx-yyC	TO-220C-3	50	Tube
SCR16xx-yyT	SCR16xx-yyT	TO-220AB	50	Tube
SCR16xx-yyTF	SCR16xx-yyTF	ITO-220AB	50	Tube

Note : xx = sensitivity, yy = voltage

## Ordering Information Scheme

### SCR 16 15 - 10 T

**SCR series**

CR = SCRs (999V ↓)  
 SCR = SCRs (1000V ↑)

**$I_{T(RMS)}$**

16 = 16A

**$I_{GT}$  Sensitivity**

15 = 15mA

**$V_{DRM} / V_{RRM}$**

600 = 600V  
 10 = 1000V

**Package type**

EI = TO-220E-3(Ins)  
 E = TO-220E-3  
 C = TO-220C-3  
 T = TO-220AB  
 TF = ITO-220AB

## Ratings and Characteristics Curves

Fig.1 - RMS on-state current versus case temperature

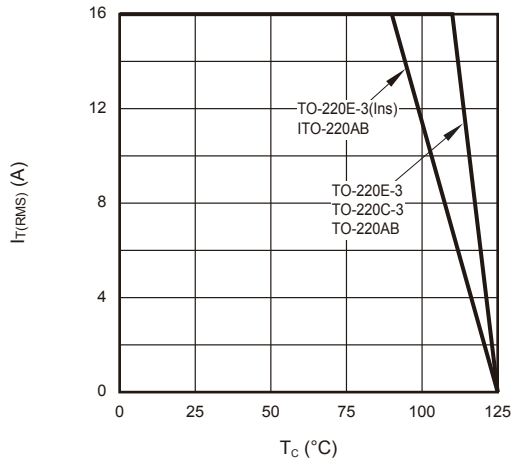


Fig.2 - Surge peak on-state current versus number of cycles

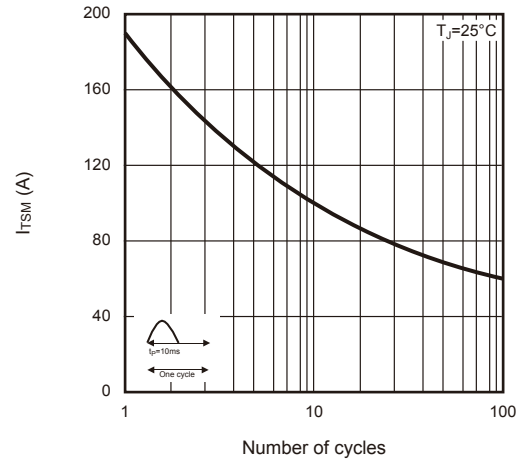


Fig.3 - On-state characteristics (maximum values)

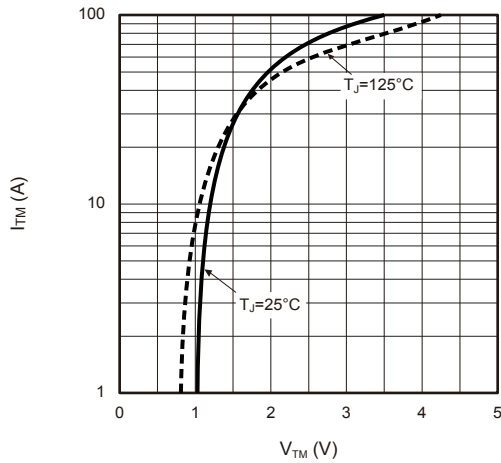


Fig.4 - Maximum power dissipation versus RMS on-state current

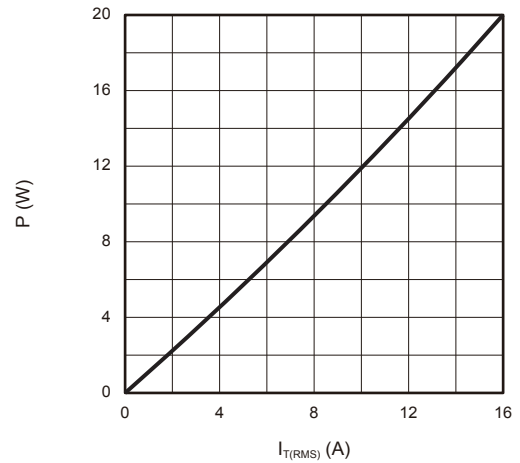
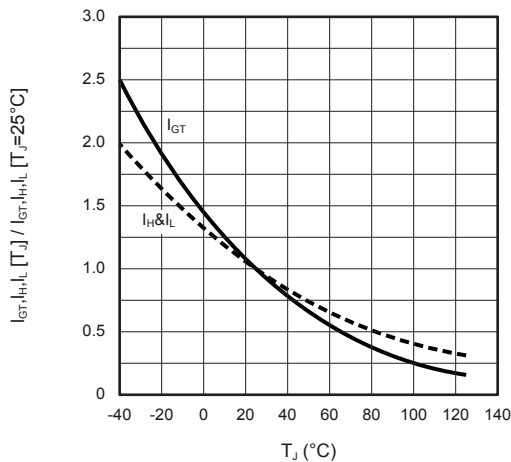
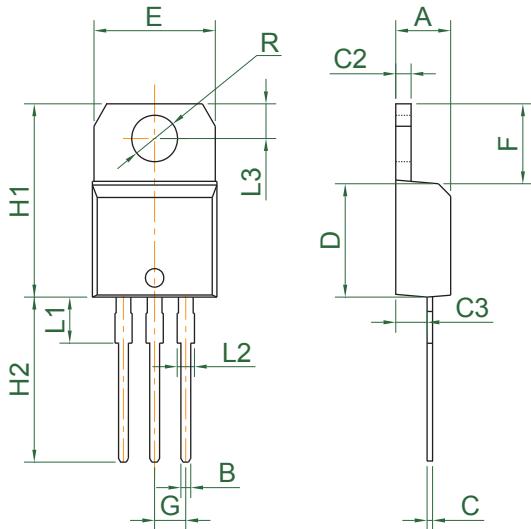


Fig.5 - Relative variations of gate trigger current, holding current and latching current versus junction temperature



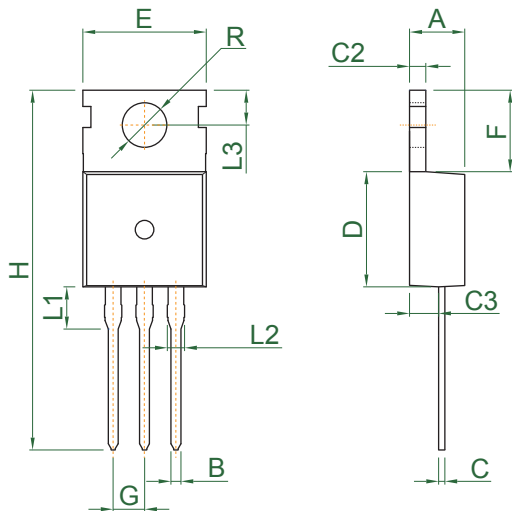
## Package Outline Dimensions

**TO-220E-3(Ins) / TO-220E-3**



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.38	-	4.61	.172	-	.182
B	0.6	-	0.92	.024	-	.036
C	0.35	-	0.7	.014	-	.028
C2	1.15	-	1.36	.045	-	.054
C3	2.35	-	2.75	.092	-	.108
D	8.6	-	9.7	.339	-	.382
E	9.8	-	10.4	.386	-	.409
F	5.85	-	6.95	.230	-	.274
G	2.4	-	2.7	.094	-	.106
H1	14.8	-	16.1	.583	-	.634
H2	13.0	-	14.0	.512	-	.551
L1	2.8	-	4.2	.110	-	.165
L2	1.14	-	1.7	.045	-	.067
L3	2.65	-	3.1	.104	-	.122
R	3.7	-	3.95	.146	-	.156

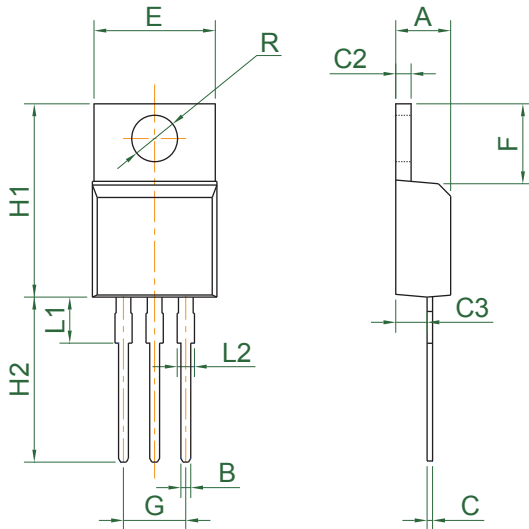
**TO-220C-3**



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.4	-	4.6	.173	-	.181
B	0.7	-	0.9	.028	-	.035
C	0.45	-	0.6	.018	-	.024
C2	1.23	-	1.48	.048	-	.058
C3	2.2	-	2.6	.087	-	.102
D	8.9	-	9.9	.350	-	.390
E	9.9	-	10.3	.390	-	.406
F	6.3	-	6.9	.248	-	.272
G	2.4	-	2.7	.094	-	.106
H	28.0	-	29.8	1.102	-	1.173
L1	3.1	-	3.7	.122	-	.146
L2	1.14	-	1.7	.045	-	.067
L3	2.65	-	2.95	.104	-	.116
R	3.45	-	3.65	.136	-	.144

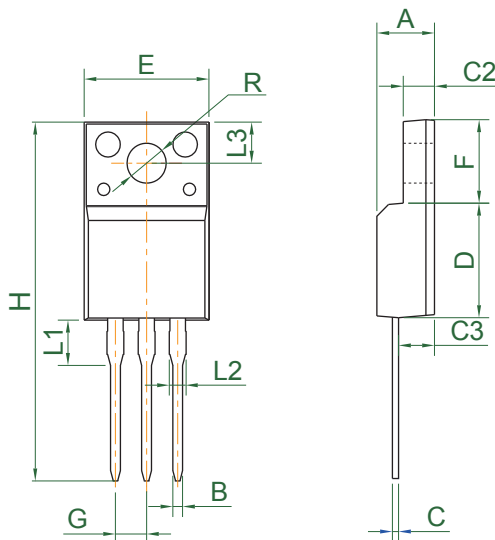
## Package Outline Dimensions

### TO-220AB



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.07	-	4.85	.160	-	.191
B	0.6	-	1.0	.024	-	.039
C	0.28	-	0.7	.011	-	.028
C2	1.1	-	1.5	.043	-	.059
C3	2.04	-	2.92	.080	-	.115
E	-	-	10.5	-	-	.413
F	5.8	-	6.93	.228	-	.273
G	4.84	-	5.32	.190	-	.209
H1	13.0	-	16.6	.512	-	.654
H2	12.7	-	14.2	.500	-	.559
L1	2.7	-	4.5	.106	-	.177
L2	1.1	-	1.7	.043	-	.067
R	3.4	-	3.95	.134	-	.156

### ITO-220AB



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.0	-	5.1	.157	-	.201
B	0.3	-	0.9	.012	-	.035
C	0.4	-	0.8	.016	-	.031
C2	2.34	-	3.3	.092	-	.130
C3	2.1	-	3.2	.083	-	.126
D	8.3	-	9.3	.327	-	.366
E	9.5	-	10.7	.374	-	.421
F	6.3	-	7.5	.248	-	.295
G	2.01	-	3.07	.079	-	.121
H	28.0	-	29.8	1.102	-	1.173
L1	2.5	-	4.3	.098	-	.169
L2	0.9	-	1.7	.035	-	.067
L3	2.5	-	3.6	.098	-	.142
R	2.7	-	4.31	.106	-	.170